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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XA916

Takes of Marine Mammals Incidental to Specified Activities; Pile Placement for ORPC Maine's Cobscook Bay Tidal Energy Pilot Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the Marine Mammal Protection Act (MMPA) implementing regulations, notification is hereby given that NMFS has issued an Incidental Harassment Authorization (IHA) to Ocean Renewable Power Company Maine, LLC (ORPC), allowing the take of small numbers of marine mammals, by Level B harassment only, incidental to pile driving in Cobscook Bay, Maine.

DATES: Effective March 12, 2012, through March 11, 2013

ADDRESSES: A copy of the IHA, the application, and the Environmental Assessment may be obtained by writing to Tammy Adams, Acting Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910 or by telephoning the contact listed here (see FOR FURTHER INFORMATION CONTACT), or visiting the internet at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications>. Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Michelle Magliocca, Office of Protected Resources, NMFS, (301) 427-8401.

#### SUPPLEMENTARY INFORMATION:

##### Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specific geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which U.S. citizens can apply for an authorization to incidentally take small numbers of marine mammals by

harassment. Section 101(a)(5)(D) further established a 45-day time limit for NMFS' review of an application, followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny the authorization.

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

#### Summary of Request

On November 2, 2011, NMFS received an application from ORPC requesting an IHA for the take, by Level B harassment, of small numbers of harbor seal (Phoca vitulina), gray seal (Halichoerus grypus), harbor porpoise (Phocoena phocoena), and Atlantic white-sided dolphin (Lagenorhynchus acutus) incidental to pile driving activities in Cobscook Bay, Maine. In accordance with the MMPA and implementing regulations, NMFS issued a notice in the Federal Register on January 19, 2012 (77 FR 2701), requesting comments from the public on the proposed IHA.

#### Description of the Specified Activity

A complete description of the specified activity may be found in NMFS' proposed IHA notice (77 FR 2701, January 19, 2012) and a summary is provided here. ORPC plans to install foundational piles to support an underwater tidal turbine unit as part of the first phase of a long-term project. The turbine unit is approximately 30 meters (m) (98 feet (ft)) long, 5 m (17 ft)

high, and 5 m (17 ft) wide and is attached to a bottom support frame, which holds the unit in place about 4.5 m (15 ft) above the sea floor. The turbine unit weighs about 69,000 pounds (lbs) and is coupled with the bottom support frame to comprise what is called a single-device TidGen™ Power System. At the interface with the seabed, the bottom support frame requires a site-specific design based on the environmental conditions at the deployment area. The foundation design for the single-device TidGen™ Power System is a pile bent arrangement consisting of 10 steel pipe piles. Each foundation pile will have a 76-centimeter (cm) (30 inch (in)) diameter and a 1-cm (half-inch) wall thickness and will rest on bedrock. Piles will vary in length from 15-18 m (50-60 ft) due to bottom sediment depth, but each pile will be driven to the top of bedrock and will protrude 3-5 m (10-15 ft) above the seafloor.

A total of 11 piles (10 for the foundation and one for mounting environmental monitoring equipment) will be driven from a moored barge for the first phase. Piles will be placed about six m (20 ft) apart in two rows of five and the rows will be separated by about 15 m (50 ft). Geotechnical data shows that the TidGen™ device will be located in an area with up to 12 m (40 ft) of marine clay and some thin layers of glacial till overlaying bedrock. Based on this data and extensive soil studies in the area, piles are expected to sink fairly deep into the mud line under their own weight. Piles will be driven the remaining depth using vibratory and impact pile driving procedures from barge-based pile driving equipment. A pile for mounting environmental monitoring equipment will also be installed with the same pile driving equipment. The monitoring pile will be two m (six ft) in diameter, or consist of an array of three piles not greater than 76 cm (30 in) in diameter. The monitoring pile will protrude about six m (20 ft) above the seafloor.

ORPC plans to use an H&M model H-1700 vibratory hammer to drive piles to the extent possible. If additional energy is required to reach bedrock, a Berminghammer model B-3505 diesel impact hammer may be used, with maximum rated impact energy of 21,533 ft-lb. ORPC expects that the need for an impact hammer will be minimal and for very short durations. To lessen the amount and intensity of sound propagation, ORPC is evaluating the use of wooden sound absorption cushions and/or bubble curtains.

#### Date and Duration of Proposed Activity

ORPC plans to begin pile driving in mid-March, 2012. Pile driving with a vibratory hammer may take up to three minutes per pile and pile driving with an impact hammer may take up to five minutes per pile. Due to strong currents during ebb and flood tides, pile driving will only occur during slack tides. ORPC expects that only one pile will be driven per tide cycle for a total of 7-12 days of pile driving during daylight hours only. NMFS Northeast Region recommends that in-water construction involving pile driving be conducted between November 8 and April 9 to avoid impacts to fisheries resources. However, ORPC may be able to conduct pile driving activities after April 9 if they can demonstrate that noise levels caused by the impact hammer are below NMFS guidelines. Although pile driving is only expected to last 7-12 days, NMFS issued the IHA for a 1-year period to allow for permitting and weather delays. Pile driving will only occur in weather that provides adequate visibility for marine mammal monitoring activities.

#### Region of Proposed Activity

The activity will occur in Cobscook Bay, in between Lubec and Eastport, Maine. Piles and other deployment materials will be transported by barge from a staging area at the Eastport Boat School or other local access point. Cobscook Bay has extremely strong tidal currents and

notably high tides, creating an extensive intertidal habitat for marine and coastal species. Water depth at the proposed project location is 26 m (85 ft) at mean lower low water. The Bay is considered a relatively intact marine system, as the area has not experienced much industrialization.

### Sound Propagation

For background, sound is a mechanical disturbance consisting of minute vibrations that travel through a medium, such as air or water, and is generally characterized by several variables. Frequency describes the sound's pitch and is measured in hertz (Hz) or kilohertz (kHz), while sound level describes the sound's loudness and is measured in decibels (dB). Sound level increases or decreases exponentially with each dB of change. For example, 10 dB yields a sound level 10 times more intense than 1 dB, while a 20 dB level equates to 100 times more intense, and a 30 dB level is 1,000 times more intense. Sound levels are compared to a reference sound pressure (micro-Pascal) to identify the medium. For air and water, these reference pressures are "re: 20  $\mu$ Pa" and "re: 1  $\mu$ Pa," respectively. Root mean square (RMS) is the quadratic mean sound pressure over the duration of an impulse. RMS is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urlick, 1975). RMS accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units rather than by peak pressures.

Source levels for the vibratory and impact hammer are expected to be 175 dB and 190 dB, respectively. Assuming a practical spreading loss of  $15 \log R$ , OPRC estimates that the 180-

dB (Level A harassment) isopleth for the impact hammer could be as far as 100 m (328 ft). The 120-dB (Level B harassment for continuous sound sources) isopleth for the vibratory hammer could be as far as 4,600 m (2.5 mi).

#### Comments and Responses

A notice of receipt and request for public comment on the application and proposed authorization was published on January 19, 2012 (77 FR 2701). During the 30-day public comment period, NMFS only received comments from the Marine Mammal Commission (Commission).

Comment 1: The Commission recommends that NMFS defer issuance of the IHA until NMFS evaluates the potential effects of construction, installation, and subsequent operation of the tidal turbine. Furthermore, the Commission recommends that NMFS then use that information as a basis for (1) determining the potential for marine mammal injury or mortality, (2) designing mitigation and monitoring measures to minimize injury and mortality caused by direct interactions, and (3) determining whether the anticipated takes are expected to have negligible impacts on marine mammal species and stocks.

Response: NMFS disagrees that issuance of the IHA should be deferred. ORPC requested authorization for incidental takings subject to a specified activity (i.e., pile driving). NMFS has not received an IHA request for incidental takings subject to further construction, installation, or subsequent operation of the tidal turbine. However, NMFS did analyze the cumulative effects of ongoing and future Cobscook Bay activities in an Environmental Assessment (EA), which included the eventual operation of ORPC's tidal turbine. The environmental effects of ORPC's long-term project were also analyzed in an EA prepared by the Federal Energy Regulatory Commission and the Department of Energy (FERC and DOE, 2012).

In summary, an assortment of mitigation and monitoring measures are expected to minimize impacts to marine species and the surrounding environment. To date, information on currently operating tidal turbines does not suggest the need for an incidental take authorization. However, if ORPC determines that there is a potential for further marine mammal harassment, they may choose to apply for another authorization.

Comment 2: If an IHA is issued, the Commission recommends that NMFS authorize the taking of harbor seals and gray seals by both in-water and in-air harassment. If authorization does not include both in-water and in-air harassment, the Commission recommends that NMFS require ORPC to shutdown pile driving activities whenever a seal is observed within the in-air Level B harassment zone.

Response: As explained in the notice of proposed IHA (77 FR 2701, January 19, 2012), elevated in-air sound levels are not a concern because the nearest significant haul-out is more than six nautical miles (nmi) away. ORPC has not observed any pinnipeds hauled out within the proposed project area during their 3 years of conducting visual observations in Cobscook Bay. Any pinniped observed swimming or diving within 152 m (500 ft) of the pile driving location would be considered to be taken by elevated underwater sounds from pile driving; therefore, there is no additional need to shutdown any time a pinniped is within the in-air Level B harassment zone.

Comment 3: The Commission recommends that NMFS require ORPC to monitor the presence and behavior of marine mammals for 30 minutes before, during, and 30 minutes after all impact and vibratory pile driving activities.

Response: As detailed in the notice of proposed IHA (77 FR 2701, January 19, 2012) and the mitigation and monitoring sections of this notice, ORPC is required to monitor the



exclusion zone for 30 minutes before, during, and 30 minutes after all impact pile driving.

ORPC is also required to monitor the larger Level B harassment zone on at least three days of vibratory pile driving. NMFS believes that this amount of monitoring is sufficient to prevent the injury or mortality of marine mammals and to document behavioral responses of marine mammals to pile driving.

Comment 4: The Commission recommends that NMFS require ORPC to record distances to observed marine mammals and document their behavior within the entirety of the Level B harassment zone for vibratory pile driving.

Response: As detailed in the notice of proposed IHA (77 FR 2701, January 19, 2012) and the mitigation and monitoring sections of this notice, ORPC is required to monitor the Level B harassment zone on at least three days of vibratory pile driving to validate take estimates and evaluate the behavioral impacts pile driving has on marine mammals out to the Level B harassment isopleth. Protected species observers will record species, behaviors, and responses to pile driving within this area.

Comment 5: The Commission recommends that NMFS require ORPC to monitor before, during, and after all soft-starts of vibratory and impact pile driving activities to gather the data needed to determine the effectiveness of this technique as a mitigation measure.

Response: NMFS disagrees that ORPC needs to monitor for marine mammals before, during, and after all soft-starts. Protected species observers will be on-site and monitoring for marine mammals at least 30 minutes before, during, and 30 minutes after all impact driving (including during soft-starts) and on at least three days of vibratory pile driving. NMFS believes that monitoring for all impact driving and on at least three days of vibratory pile driving will

allow for adequate interpretation of how marine mammals are behaving in response to pile driving, including during soft-starts.

#### Description of Marine Mammals in the Area of the Specified Activity

Marine mammals with known presence in this region of Cobscook Bay are the harbor seal, grey seal, harbor porpoise, and Atlantic white-sided dolphin. ORPC has been conducting incidental visual observations of marine mammals in Cobscook Bay since 2007, for a total effort of 252 4-hr observational periods over 222 days. During this time, marine mammal observers have recorded 57 seals, 47 harbor porpoises, and two Atlantic white-sided dolphins (Table 1). No observations of any whale species have been made in Cobscook Bay by ORPC since monitoring began in 2007. In addition, a review of available databases does not indicate any recorded whale sightings in Cobscook Bay. Other species that may possibly occur in the vicinity of the proposed activity include North Atlantic right whale (*Eubalaena glacialis*), humpback whale (*Megaptera novaengliae*), fin whale (*Balaenoptera borealis*), minke whale (*Balaenoptera acutorostrata*), and sei whale (*Balaenoptera borealis*). However, these five species are generally associated with open ocean habitats and occur in more offshore locations. NMFS has concluded that the specified activity will not impact these five species and they are not discussed further. Information on the harbor seal, grey seal, harbor porpoise, and Atlantic white-sided dolphin was provided in the January 19, 2012 Federal Register notice (77 FR 2701).

Month	Hours of effort	Harbor and grey seal	Harbor porpoise	Atlantic white-sided dolphin
January	16	0	0	0
February	36	0	1	0
March	56	1	0	0

Month	Hours of effort	Harbor and grey seal	Harbor porpoise	Atlantic white-sided dolphin
April	160	4	3	0
May	56	1	3	0
June	84	8	1	0
July	84	4	10	0
August	120	16	24	2
September	100	9	5	0
October	96	8	0	0
November	72	4	0	0
December	104	2	0	0
Total	1,008	57	47	2

Table 1. Marine mammal observations in the proposed project vicinity between December 2007, and December 2010.

#### Potential Effects on Marine Mammals

Elevated in-water sound levels from pile driving in the project area may temporarily impact marine mammal behavior. A detailed description of potential impacts to marine mammals can be found in NMFS' January 19, 2012 Federal Register notice (77 FR 2701) and is summarized here.

Marine mammals are continually exposed to many sources of sound. For example, lightning, rain, sub-sea earthquakes, and animals are natural sound sources throughout the marine environment. Marine mammals produce sounds in various contexts and use sound for various biological functions including, but not limited to, (1) social interactions; (2) foraging; (3) orientation; and (4) predator detection. Interference with producing or receiving these sounds

may result in adverse impacts. Audible distance or received levels will depend on the sound source, ambient noise, and the sensitivity of the receptor (Richardson et al., 1995). Marine mammal reactions to sound may depend on sound frequency, ambient sound, what the animal is doing, and the animal's distance from the sound source (Southall et al., 2007).

### Hearing Impairment

Marine mammals may experience temporary or permanent hearing impairment when exposed to loud sounds. Hearing impairment is classified by temporary threshold shift (TTS) and permanent threshold shift (PTS). There are no empirical data for when PTS first occurs in marine mammals; therefore, it must be estimated from when TTS first occurs and from the rate of TTS growth with increasing exposure levels. PTS is likely if the animal's hearing threshold is reduced by  $\geq 40$  dB of TTS. PTS is considered auditory injury (Southall et al., 2007) and occurs in a specific frequency range and amount. Irreparable damage to the inner or outer cochlear hair cells may cause PTS; however, other mechanisms are also involved, such as exceeding the elastic limits of certain tissues and membranes in the middle and inner ears and resultant changes in the chemical composition of the inner ear fluids (Southall et al., 2007). Due to proposed mitigation measures and source levels in the proposed project area, NMFS does not expect marine mammals to be exposed to PTS levels.

### Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a loud sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises and a sound must be louder in order to be heard. TTS can last from minutes or hours to days, but is recoverable. TTS also occurs in specific frequency ranges; therefore, an animal might experience a temporary loss of hearing sensitivity only between the frequencies of 1 and 10 kHz, for example. The amount

of change in hearing sensitivity is also variable and could be reduced by 6 dB or 30 dB, for example. Recent literature highlights the inherent complexity of predicting TTS onset in marine mammals, as well as the importance of considering exposure duration when assessing potential impacts (Mooney et al., 2009a, 2009b; Kastak et al., 2007). Generally, with sound exposures of equal energy, quieter sounds (lower SPL) of longer duration were found to induce TTS onset more than louder sounds (higher SPL) of shorter duration (more similar to subbottom profilers). For sound exposures at or somewhat above the TTS-onset threshold, hearing sensitivity recovers rapidly after exposure to the sound ends. Southall et al. (2007) considers a 6 dB TTS (i.e., baseline thresholds are elevated by 6 dB) to be a sufficient definition of TTS-onset. NMFS considers TTS as Level B harassment that is mediated by physiological effects on the auditory system; however, NMFS does not consider onset TTS to be the lowest level at which Level B harassment may occur.

### Behavioral Effects

Behavioral responses to sound are highly variable and context-specific. An animal's perception of and response to (in both nature and magnitude) an acoustic event can be influenced by prior experience, perceived proximity, bearing of the sound, familiarity of the sound, etc. (Southall et al., 2007). If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or populations. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (e.g., Lusseau and Bejder, 2007; Weilgart, 2007). Based on the limited amount of pile driving and use of vibratory pile driving, any impacts to marine mammal behavior from ORPC's pile driving operations are expected to be

temporary. Any disturbance to marine mammals is likely to be in the form of temporary avoidance or alteration of opportunistic foraging behavior near the pile driving location.

#### Non-pulse Sounds

The studies that address responses of mid-frequency cetaceans (such as Atlantic white-sided dolphins) to non-pulse sounds (like vibratory pile driving) include data gathered both in the field and the laboratory and related to several different sound sources (of varying similarity to chirps) including: pingers, drilling playbacks, ship and ice-breaking noise, vessel noise, acoustic harassment devices (AHDs), acoustic deterrent devices (ADDs), mid-frequency active sonar, and non-pulse bands and tones. While none of these studies are specific to Atlantic white-sided dolphins, they include species with similar auditory bandwidths. Southall et al. (2007) were unable to come to a clear conclusion regarding the results of these studies. In some cases animals in the field showed significant responses to received levels between 90 and 120 dB, while in other cases these responses were not seen in the 120 to 150 dB range. This disparity is likely due to contextual variables beyond received level and species differences.

The studies that address responses of high-frequency cetaceans (such as the harbor porpoise) to non-pulse sounds include data gathered both in the field and the laboratory and related to several different sound sources (of varying similarity to chirps), including: pingers, AHDs, and various laboratory non-pulse sounds. All of these data were collected from harbor porpoises. Southall et al. (2007) concluded that the existing data indicate that harbor porpoises are likely sensitive to a wide range of anthropogenic sounds at low received levels (around 90 to 120 dB), at least for initial exposures. All recorded exposures above 140 dB induced profound and sustained avoidance behavior in wild harbor porpoises (Southall et al., 2007). Rapid habituation was noted in some but not all studies.

There are limited data available on the behavioral effects of non-pulse noise on pinnipeds while underwater; however, field and captive studies to date collectively suggest that pinnipeds do not react strongly to exposures between 90 and 140 dB re: 1  $\mu$ Pa; no data exist from exposures at higher levels.

### Impulse Sounds

Southall et al. (2007) also addressed behavioral responses of marine mammals to impulse sounds (like impact pile driving). The studies that address the responses of mid-frequency cetaceans to impulse sounds include data gathered both in the field and the laboratory and related to several different sound sources (of varying similarity to boomers), including: small explosives, airgun arrays, pulse sequences, and natural and artificial pulses. The data show no clear indication of increasing probability and severity of response with increasing received level. Behavioral responses seem to vary depending on species and stimuli. Data on behavioral responses of high-frequency cetaceans to multiple pulses is not available. Although individual elements of some non-pulse sources (such as pingers) could be considered pulses, it is believed that some mammalian auditory systems perceive them as non-pulse sounds (Southall et al., 2007).

The studies that address the responses of pinnipeds in water to impulse sounds include data gathered in the field and related to several different sources, including: small explosives, impact pile driving, and airgun arrays. Quantitative data on reactions of pinnipeds to impulse sounds is limited, but a general finding is that exposures in the 150 to 180 dB range generally have limited potential to induce avoidance behavior (Southall et al., 2007).

As discussed below, impacts to marine mammal reproduction are not anticipated because there are no known pinniped rookeries within the proposed project area and Cobscook Bay is not

a known breeding ground for cetaceans. Marine mammals may avoid the area around the hammer, thereby reducing their exposure to elevated sound levels. NMFS expects any impacts to marine mammal behavior to be temporary, Level B harassment (for example, avoidance or alteration of behavior). ORPC conservatively assumes 12 pile driving days may occur over the validity of the IHA. Marine mammal injury or mortality is not likely, as the 180 dB isopleth (NMFS' Level A harassment threshold for cetaceans) for the impact hammer is expected to be no more than a 100-m (328 ft) radius. ORPC proposes to continuously monitor a 152-m (500-ft) area around the sound source and cease all pile driving if a marine mammal is observed nearing or within this 152-m (500-ft) isopleth.

#### Anticipated Effects on Habitat

No permanent detrimental impacts to marine mammal habitat are expected to result from pile driving. Pile driving (resulting in temporary ensonification) may impact prey species and marine mammals by causing avoidance or abandonment of the area; however these impacts are expected to be local and temporary. The benthic impact of the foundation for this phase of the proposed project will be about 10 m<sup>2</sup> (113 ft<sup>2</sup>) during pile placement. While the foundation frame will take up a limited amount of space on the seafloor, there are no expected adverse impacts to marine mammal habitat.

#### Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses. There are no subsistence hunting



grounds within the action area and since the activity will not result in marine mammal mortality, the availability of marine mammals for subsistence uses will not be impacted. ORPC will implement the following mitigation measures to minimize adverse impacts to marine mammals:

#### Sound Attenuation Device

When using a diesel impact hammer to “proof” piles, ORPC will use wooden sound absorption cushions and/or a bubble curtain to reduce hydroacoustic sound levels and avoid the potential for marine mammal injury. Based on previous studies, sound attenuation devices are expected to reduce sound levels by at least 5 dB.

#### Exclusion Zone

The purpose of the proposed exclusion zone is to prevent Level A harassment (injury) of any marine mammal species. Current NMFS practice regarding exposure of marine mammals to anthropogenic sound is that in order to avoid the potential for injury (PTS), cetaceans and pinnipeds should not be exposed to impulsive sounds of 180 and 190 dB or above, respectively. These levels are considered precautionary as it is likely that more intense sounds would be required before injury would actually occur (Southall et al., 2007). During all in-water impact pile driving, ORPC will establish a preliminary marine mammal exclusion zone around each pile to avoid exposure to sounds at or above 180 dB. The preliminary exclusion zone will have a radius of 152 m (500 ft). This encompasses the initial estimate of the 180 dB isopleth, where injury could occur, plus a 52-m (171-ft) buffer zone. Once hydroacoustic monitoring is conducted, the exclusion and buffer zone may be adjusted accordingly so that marine mammals are not exposed to Level A harassment sound pressure levels. The exclusion zone will be monitored continuously during impact pile driving to ensure that no marine mammals enter the area. Protected species observers (PSOs) will be stationed on two observer boats, one 152 m

(500 ft) upstream and one 152 m (500 ft) downstream of the installation site. One observer on each vessel will survey the exclusion zone, while the second observer will conduct behavioral monitoring outwards to a distance of 1 nmi. Several floats anchored at 152 m (500 ft) and 305 m (1,000 ft) will be located around the installation site to help identify when marine mammals are entering or within the exclusion zone. An exclusion zone for vibratory pile driving or installation of concrete piles is unnecessary as source levels will not exceed the Level A harassment threshold.

#### Pile Driving Shut Down and Delay Procedures

If a PSO sees a marine mammal within or approaching the exclusion zone prior to start of impact pile driving, the observer will notify the on-site project lead (or other authorized individual) who will then be required to delay pile driving until the marine mammal has moved 305 m (1,000 ft) from the sound source or if the animal has not been resighted within 30 minutes. If a marine mammal is sighted within or on a path toward the 152-m (500-ft) exclusion zone during pile driving, pile driving will cease until that animal has moved 305 m (1,000 ft) and is on a path away from the exclusion zone or 30 minutes has lapsed since the last sighting.

#### Soft-start Procedures

A “soft-start” technique will be used at the beginning of each pile installation to allow any marine mammal that may be in the immediate area to leave before the pile hammer reaches full energy. For vibratory pile driving, the soft-start procedure requires contractors to initiate noise from the vibratory hammer for 15 seconds at 40-60 percent reduced energy followed by a 1-minute waiting period. The procedure will be repeated two additional times before full energy may be achieved. For impact hammering, contractors will be required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting

period, then two subsequent three-strike sets. Soft-start procedures will be conducted any time hammering ceases for more than 30 minutes.

### Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth “requirements pertaining to the monitoring and reporting of such taking”. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for IHAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present.

Hydroacoustic monitoring will be performed at the initial installation of each pile driving method to ensure that the harassment isopleths are not extending past the calculated distances described in this notice and the proposed IHA (77 FR 2701, January 19, 2012) and to assess the efficiency of the sound attenuation devices. ORPC will designate two biologically-trained, on-site PSOs, approved in advance by NMFS, to monitor the exclusion zone (preliminarily set at 152 m [500 ft]) for marine mammals 30 minutes before, during, and 30 minutes after all impact pile driving activities and call for shut down if any marine mammal is observed within or approaching the exclusion zone. These PSOs will be positioned on two vessels, one anchored upstream and one anchored downstream at 152 m (500 ft) on the edge of the exclusion zone. One observer on each vessel will survey inwards toward the pile driving site and the second observer will conduct behavioral monitoring outwards to a distance of 1 nmi during all impact pile driving. Additional PSOs will be stationed at the Level B harassment isopleth (preliminarily set at 4,600 m [2.5 mi]) on at least three days of vibratory pile driving to validate take estimates

and evaluate the behavioral impacts pile driving has on marine mammals out to the Level B harassment isopleth.

PSOs will be provided with the equipment necessary to effectively monitor for marine mammals (for example, high-quality binoculars, compass, and range-finder as well as a digital SLR camera with telephoto lens and video capability) in order to determine if animals have entered into the exclusion zone or Level B harassment isopleth and to record species, behaviors, and responses to pile driving. If hydroacoustic monitoring indicates that threshold isopleths are greater than originally calculated, ORPC will contact NMFS within 48 hours and make the necessary adjustments. Likewise, if threshold isopleths are actually less than originally calculated, downward adjustments may be made to the exclusion and buffer zone. PSOs will submit a report to NMFS within 90 days of completion of pile driving. The report will include data from marine mammal sightings (such as date, time, location, species, group size, and behavior), any observed reactions to construction, distance to operating pile hammer, and construction activities occurring at time of sighting and environmental data for the period (wind speed and direction, Beaufort sea state, cloud cover, and visibility).

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as an injury (Level A harassment), serious injury, or mortality, ORPC will immediately cease the specified activities and immediately report the incident to the Acting Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to [Tammy.Adams@noaa.gov](mailto:Tammy.Adams@noaa.gov) and [Michelle.Magliocca@noaa.gov](mailto:Michelle.Magliocca@noaa.gov) and the Northeast Regional Stranding Coordinator ([Mendy.Garron@noaa.gov](mailto:Mendy.Garron@noaa.gov)). The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;

- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hrs preceding the incident;
- Water depth;
- Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hrs preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities will not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with ORPC to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. ORPC may not resume their activities until notified by NMFS via letter, email, or telephone.

In the event that ORPC discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), ORPC will immediately report the incident to the Acting Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to [Tammy.Adams@noaa.gov](mailto:Tammy.Adams@noaa.gov) and [Michelle.Magliocca@noaa.gov](mailto:Michelle.Magliocca@noaa.gov) and the Northeast Regional Stranding Coordinator at 978-281-9300 ([Mendy.Garron@noaa.gov](mailto:Mendy.Garron@noaa.gov)). The report must include the same information identified in the paragraph above. Activities may continue while NMFS

reviews the circumstances of the incident. NMFS will work with ORPC to determine whether modifications in the activities are appropriate.

In the event that ORPC discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), ORPC will report the incident to the Acting Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to [Tammy.Adams@noaa.gov](mailto:Tammy.Adams@noaa.gov) and [Michelle.Magliocca@noaa.gov](mailto:Michelle.Magliocca@noaa.gov) and the NMFS Northeast Stranding Hotline (866-755-6622) and/or by email to the Northeast Regional Stranding Coordinator ([Mendy.Garron@noaa.gov](mailto:Mendy.Garron@noaa.gov)), within 24 hrs of the discovery. ORPC will provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue while NMFS reviews the circumstances of the incident.

#### Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as:

any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Based on the application and subsequent analysis, the impact of the described pile driving activities, in conjunction with the required mitigation and monitoring measures, may result in, at

most, short-term modification of behavior by small numbers of marine mammals within the action area. Marine mammals may avoid the area or temporarily alter their behavior at time of exposure. Current NMFS practice regarding exposure of marine mammals to anthropogenic noise is that in order to avoid the potential for injury (PTS), cetaceans and pinnipeds should not be exposed to impulsive sounds of 180 and 190 dB or above, respectively. This level is considered precautionary as it is likely that more intense sounds would be required before injury would actually occur (Southall et al., 2007). Potential for behavioral Level B harassment is considered to have occurred when marine mammals are exposed to sounds at or above 160 dB for impulse sounds (such as impact pile driving) and 120 dB for non-pulse noise (such as vibratory pile driving). These levels are also considered precautionary.

Distances to NMFS' harassment thresholds were calculated based on the expected sound levels at each source and the expected attenuation rate of sound (see 77 FR 2701, January 19, 2012). The 100-m (328-ft) distance to the Level A harassment threshold provides protected species observers plenty of time and adequate visibility to prevent marine mammals from entering the area during impact pile driving. This will prevent marine mammals from being exposed to sound levels that reach the Level A harassment threshold.

Based on ORPC's marine mammal monitoring records and the maximum number of pile driving days, NMFS authorized the take by Level B harassment of 72 total seals (because they cannot always be identified to the species-level), 72 harbor porpoises, and two Atlantic white-sided dolphins. These numbers are extremely conservative and indicate the maximum number of animals expected to occur within the largest Level B harassment isopleth 4,600 m (2.5 mi). For more detailed information on how these numbers were calculated, see the notice of proposed IHA (77 FR 2701, January 19, 2012).

## Negligible Impact and Small Numbers Analysis and Determination

NMFS has defined "negligible impact" as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." In making a negligible impact determination, NMFS considers a number of factors which include, but are not limited to, the number of anticipated injuries or mortalities (none of which would be authorized here), number, nature, intensity, and duration of Level B harassment, and the context in which takes occur.

As described above, marine mammals will not be exposed to activities or sound levels which could result in injury (PTS), serious injury, or mortality. Pile driving will occur in relatively shallow coastal waters of Cobscook Bay. The project area is not considered significant habitat for marine mammals. The closest significant pinniped haul out is more than six nmi away, which is well outside the project area's largest harassment zone. Marine mammals approaching the action area will likely be traveling or opportunistically foraging. The amount of take NMFS authorized, is considered small (less than one percent) relative to the estimated populations of 91,000 harbor seals, 250,000 gray seals, 89,054 harbor porpoises, and 63,000 Atlantic white-sided dolphins. Marine mammals may be temporarily impacted by pile driving noise. However, marine mammals are expected to avoid the area, thereby reducing exposure and impacts, and mitigation will prevent injury. Pile driving activities are expected to occur for about 7-12 days total. There is no anticipated effect on annual rates of recruitment or survival of affected marine mammals. Based on the application and subsequent analysis, the impact of the described pile driving operations may result in, at most, short-term modification of behavior by



small numbers of marine mammals within the action area. Marine mammals may avoid the area or temporarily alter their behavior at time of exposure.

Based on the analysis contained in this notice, the proposed IHA notice (77 FR 2701, January 19, 2012), and the IHA application, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS has determined that ORPC's pile driving activities will result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking will have a negligible impact on the affected species or stocks.

#### Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action.

#### Endangered Species Act (ESA)

No marine mammal species listed under the ESA are anticipated to occur within the action area. Therefore, section 7 consultation under the ESA is not required.

#### National Environmental Policy Act (NEPA)

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500-1508), and NOAA Administrative Order 216-6, NMFS prepared an Environmental Assessment (EA) to consider the environmental impacts of issuance of a 1-year

IHA and made a finding of no significant impact FONSI. The EA and FONSI are available on the NMFS website listed in the beginning of this document (see ADDRESSES).

Dated: March 8, 2012.

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